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A STUDY ON THE DISEASE RESISTANCE IN HEVEA BRASILIENSIS
TO COLLETOTRICHUM GLOEOSPORIOIDES

A thesis submitted to the Faculty of Applied Science,
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for the
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by

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A B S T R A C T

The factors responsible for disease resistance of Hevea clones to C. gloeosporioides were studied. First, field observations showed that the susceptibility of Hevea to the disease varied in different clones and an interaction was seen between clones and locations. When the infection was low incidence and severity of the disease were linearly related; a curvilinear relationship was evident when the level of infection was high.

Isolates of C. gloeosporioides varied in their growth characteristics, morphology and spore production. They showed differential susceptibility to various clones.

Leachate of resistant clones suppressed the growth of the pathogen and favoured appressorium formation. In vitro studies indicated that growth promoting substances were not conducive for formation of appressoria. There was no difference either quantitatively or qualitatively in sugars and amino acids in the leachate of different clones.

Waxes and substances associated with it are inhibitory on the pathogen at high concentrations. These substances separated by TLC showed two inhibitory zones. Phenolic and acidic substances are associated with the crude wax extract.

Leaves of resistant clones supported less germtube growth than susceptible leaves, but favoured appressorium formation. On penetration of resistant tissues a rapid disorganization of the cell content was observed, arresting hyphal growth. In susceptible clones hyphae invaded deeper in to the tissues and colonized the mesophyll cells both inter and intracellularly;

acervuli were formed 72 h after inoculation. The migration of nuclei towards the site of penetration was observed in resistant clones.

There was no relationship between either total or orthodihydroxy phenol level and field resistance of Hevea clones. But the infection was accompanied by a change in the orthodihydroxy phenol level, particularly in resistant clones.

In Hevea, peroxidase activity was higher than polyphenoloxidase and increase in peroxidase level with the infection was more pronounced in resistant clones. Infection also resulted in the increase of soluble protein content.

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